Resume

1. Name Dr. Gulzar Singh(M.Sc., Ph.D.)

2. Date of Birth September 22, 1946

3. Place of Birth Saro Badh (Jalandhar, Panjab, India)

4. Nationality Indian

5. Marital Status Married

6. Present Address

Professors of Physics
Physics Department
Panjab University
Chandigarh-160014, India.

7. Academic Qualifications

Sr. No.	Examination	University	Year	%age of marks / Position	Division	Merit
1	Hr. Sec. Part I	Panjab	1961	79.3	First	Scholarship
2.	Hr. Sec.Part II	Panjab	1963	76.1	First	Scholarship
3	B.Sc..Part I	Panjab	1964	72.1	First	Scholarship
4.	B.Sc.(Subsidiary)	Panjab	1966	76.2	First	---
5.	B.Sc. Hons. School	Panjab	1967	12^{th} position out of 48 *	First	---
6	M.Sc Hons. School.	Panjab	1969	25^{th} position out of 43*	High Second	---
7	Ph.D.	Panjab	1983	----------	----------	----
8	French certificate	Panjab	1973	70.0	First	

* In Hons. School System marks were not declared, only position in class and division were declared..

8. Field of specialization: Experimental Nuclear Physics.

9. Title of Ph.D.Thesis:

Study of the 27" Chandigarh Variable Energy Cyclotron and the Integrated Reaction Cross-Section for the Reaction 48Ca(p,n)48Sc from 1.885 to 5.1 MeV Bombarding Energies

10. Research Experience: 39 years

Brief Summary of Research Work done and future research plan:

10.1. Testing, installation and operation of the Chandigarh Variable Energy Cyclotron:

Since July 1969, I have been doing research work in nuclear Physics. I took an active part in testing and installation of 27'' Variable Energy Cyclotron at Panjab University, Chandigarh.Various components of the machine was renovated and assembled.The entire assembly was evacuated to a vacuum better than 10 micron.

The oscillator was tested under no load condition from 10 to 22 MHz.The performance of the ion-source was examined with the help of an auxiliary extraction device. The field of the cyclotron magnet was mapped and the data were used to perform preliminary calculations for the orbits. The deflector, the quadrupole lenses and analyzing magnet were tested to optimize their operation.

The cyclotron generated the 4 Mev proton beam for the first time in July.,1975. The machine was also tested to produce variable energy alphas. Later on, the beam extraction efficiency of the machine was improved by proper positioning of shim foils between pole –tips and pole faces. The machine is being used in nuclear and solid state physics research,at present.

10.2. Experimental studies with 5.5 MeV Vand-de-Graaff accelerator at Bhabha Atomic Research Centre,Trombay,Bombay:

From september1975 to November 1980, I participated in the experimental studies conducted by the nuclear reactions group under the supervision of Dr. M.K.Mehta , Head, Nuclear Physics Division, at the 5.5 MeV Vand -de-Graaff accelerator laboratoy ,BARC, Trombay, Bombay. There I handled the Vand-de-Graaff machine and the numerous other electronic instruments used in data taking in nuclear reactions. I also fabricated a current integtator to measure the pulsating beam from the accelerator.

I participated in the experimental preprations ,data taking and analysis for the $^{40}Ca(\alpha,\alpha)^{40}Ca$, $^{80}Se(p,n)^{80}Br$, $^{65}Cu(p,n)^{65}Zn$, $^{48}Ca(p,n)^{48}Sc$ and $^{41}K(p,n)^{41}Ca$ reactions:

(a) The angular distributions for the inelastic scattering of alphas were analysed to assign spins to the unbound states of the compound nucleus ^{44}Ti.

(b) The energy averaged data in (p,n) reactions were analyzed to determine the optical model parameters and to test the predictions of the statistical theories. We also used our data to ver ify the predictions of microscopic optical model of Jeukenne et.al.at low energies.

(c) The observed isobaric analog resonances and other intermediate width structureswere also analysed to extract their parameters.

(d) The fine resolution excitation functions were subjected to fluctuation analysis to extract the coherent widths, the level density parameters, the relative direct contributions, and the number of participating coherent channels.

10.3. Experimental Studies with the Chandigarh Variable Energy Cyclotron:

Since 1980, I have been working on in-beam gamma-ray spectroscopy in proton induced reactions (proton Coulomb excitations and(p,n) reactions) at the Chandigarh Variable Energy Cyclotron to extract information about the low lying Energy levels: spin, lifetime(using DSAM technique),level structure and about the transitions: the mixing ratios, the branching ratios and the reduced transition probabilities. Now we have developed Chandigarh Variable Energy Cyclotron as a regional facility for proton induced X-ray spectrometry for elemental analysis. A new magnet power supply from M/S danfysik Denmark , Model 853, of 400A/125 has stability of ±10 ppm (8hours).The RF oscillator has been provided with an efficient solid state (high voltage silicon network) power supply . A versatile PIXE target scattering chamber has got been fabricated fromM/S NEW Poona industries,Pune,India..The performance of PIXE set-up was tested by taking the PIXE spectra of a poly-atomic composite material coated on aluminium, using 3MeV proton beam.. To calibrate.the PIXE setup the rare earth element targets with measured thickness were used to reproduce the L-shell X-ray production cross-section of these elements by 3 MeV protons. Along with PIXE ,PIGE and RBS facilities have also been developed. for elemental analysis.PIGE facility is used for detecting light elements.RBS facility is used for elemental analysis and the depth profiling of the thin films.

10.4. Experimental Studies at Variable Energy Cyclotron Calcutta:

Universal data from (n,p) ractions with 14 Mev neutrons were analysed to develop the systematics of pre-equilibrium contributions as well as of the single particle level densties The experimental results were interpreted in terms of recent theories. Some reactions like Cu(α ,x), Al(α ,x) and In(α ,x) were studied with alpha beams at VEC from 30 to 70 MeV beam energies to compare their preequlibrium contributions. with the systematics previously developed by us from analysis of universal data from (n,p) reactions with 14 MeV neutrons.

10.5. Experimental Studies with 15 U D Pelletron at IUAC,New Delhi :

Study of the entrance channel mass asymmetry effects and exit channel effect in heavy-ion induced fusion reactions through inclusive measurements of light particle spectra. These effects arise due to dynamical hindrance in the fusion process. Study of these effects through refined exclusive measurements of light particle spectra either in coincidence with recoiling evaporation residues using HIRA or in coincidence with characteristic gamma rays.

Measurement of evaporation residues in coincidence with gamma rays multiplicities using HIRA and gamma ray multiplicity filter enables us to measure spin distribution of the residues and to deduce the $L_{critical}$

Nuclear life-time measurements using DSAM and RDM techniques for various excited states of the ground state bands in various nuclei Study of Reaction Dynamics Study of Heavy ion induced fusion-fission dynamics and nuclear viscosity through measurement of neutron multiplicity and mass gated neutron multiplicity .,fission fragment mass and

angular distributions for heavy systems. Study of Fusion- fission dynamics near super heavy region, fusion around the Coulomb Barrier, Fusion excitation functions and barrier distributions of medium and heavy mass systems. Fusion barrier distributions of heavy nuclei by quasi-elastic scattering method

11 Research projects either completed in recent past / or ongoing
Research Projects carried out/or in progress :

Title of the Project	**Name of the funding Agency**	**Duration**	**Remarks Myself as**
1. Study of Fusion Reaction at high excitation and angular momentum	**IUAC-UGC, New Delhi.**	**1999-2002**	**co-investigator**
2. Study of role of dynamical effects in the fusion reaction via light particle evaporation.	**IUAC-UGC, New Delhi.**	**2002-2006**	**Principal investigator**
3. Regional facility for X-ray spectrometry at variable energy cyclotron Chandigarh	**DST, New Delhi**	**2003-2007.**	**Co-investigator**
4.Study of Dynamical effects via neutron evaporation.	**IUAC-UGC, New Delhi.**	**2004-208**	**Co-investigator**
5.Fusion-fission Dynamics near super heavy region.	**IUAC-UGC**	**2006-2009**	**Co-investigator**
6.Nuclear lifetime measurement using DSAM and RDM techniques	**IUAC-UGC**	**2006-2008**	**Co-investigator**
7.Trace Element Analysis by Proton induced X-ray emission(PIXE) technique at Chandigarh cyclotron	**DST-New Delhi**	**2007-2010**	**Co-investigator**
8.Anomalous Deviations from statistical Evaporation spectra	**IUAC-UGC**	**2008-2011**	**Principal investigator**
9. Systematics of Multi-Step Compound pre-equilibrium emission of neutrons from symmetric	**IUAC-UGC**	**Accepted and sanctioned in AUC July-2013 at IUAC, New**	**Principal investigator**

Title of the Project	Name of the funding Agency	Duration	Remarks Myself as
light-heavy ion collisions at low projectile energies Elab~4-7MeV/A		**Delhi**	
10. Dynamical fusion hindrance effects on light particle spectra and angular distribution with symmetric entrance channels at-above coulomb barrier energies.	**UGC**	**Submitted**	**Principal investigator**

12. Experience in Research Supervision / guidance

Three students have completed their M.Phil and four have completed their Ph.D. At present one student is working for her Ph.D.

13. Research publications: List of Research publications attached. at section no. 17

14. Teaching Experience: 34 years

Courses Taught:

Undergraduate classes: Physics practicals, Optics, heat, Electricity and magnetism,Electronics, nuclear Physics,Vibrations,Waves and Electromagnetic Theory. Laser, Modern physics.

Postgraduate classes: Physics Practicals,Classical electrodynamics Nuclear Physics,Quantum Mechanics and Field Theory Post M.Sc Accelerator Physics course./M.Phil : Methods of Experimental Physics,Experimental Nuclear Physics, Beam dynamics and transport system,Accelerators, Accelerator Physics laboratory.

Place of teaching: Department of Physics,Panjab university,Chandigarh.

15. Positions held:

1. Junior Research fellow, UGC (July 1969 to January, 1974).
2. Teaching Assistant, Department of Physics, P.U.Chandigarh (Jan.1974 to Sept.1975).
3. Senior Research Fellow, DAE (Oct.1975 to Nov.1980).
4. Research Associate, Department of Physics, P.U. Chandigarh (Dec.1980 toFeb.1983).
5. Lecturer, Department of Physics, P.U. Chandigarh (Feb.1984 to Dec.1985).
6. Senior lecturer, Department of Physics, P.U. Chandigarh (Jan.1986 to Dec.1993).
7. Lecturer Selection grade, Department of Physics, P.U. Chandigarh (Jan. to Nov. 1994).

8. Reader, Department of Physics, P.U. Chandigarh (Nov.1994-June 2002).
9. Professor of physics, P.U. Chandigarh (August 2003-September 2008).
10. Professor-re-employed of physics P.U. Chandigarh (September 2008-September 2011).

16. Membership of Learned societies and other academic bodies:

Life Member of Indian Physics Association.

17. List of Publications:

A. Papers published in refreed research journals:

1. Microscopic nucleon optical model potential at low energies, S. Kailash, S.K.Gupta, M.K. Mehta and Gulzar Singh, Phys.Rev.C 26, 830 (1982).

2. Reaction 48Ca(p,n) from En=1.885 to 5.1, Gulzar Singh,S.Kailash,S.Saini, A.Chatterjee,M.Balakrishna and M.K.Mehta, Pramana 19 (1982) 565.

3. Isobaric Analogue Resonances in the 41 K and 65 Cu(p.n) reactions, S.Saini, Gulzar Singh, A.Chatterjee, S.Kailash, D.D. Karnik, N,.Veerabahu and M.K.Mehta, Nuclear Physics A 405 (1983) 55-60.

4. Radio-Isotope Production Facility at Chandigarh VEC. V.K. Mittal,Gulzar Singh, K.P.Singh, D.K.Avasthi, K.C.Jain, S.R.Bahadur, T.S.Cheema, I.M.Govil and H.S. Hans, Indian J. Phys.58a (1984) 257.

5. Coulomb Excitation of Cadmium isotopes with Protons:K.P.Singh,D.C.Tayal, G.Singh and H.S.Hans Phys.Rev.C 31 (1985)79.

6. Coloumb Excitation of 165 Ho: K.P.Singh, D.C.Tayal, G.Singh, and H.S.Hans Phys.Rev.C31 (1985) 1726.

7. Coloumb Excitation of 105Pd Protons, D.C.Tayal,K.P.Singh,V.K.Mittal,GulzarSingh H.S.Hans Phys.Rev.C 32 (1985) 1882.

8. Operation of R.F. Oscillator of the Chandigarh Variable Energy Cyclotron, S.R. .Bahadur,Gulzar Singh,I.M.Govil and H.S. Hans,Indian J.of Physics 62 A(1988) 647.

9. Coulomb Excitation Studies in Antimony Isotopes, K.C.Jain,K.P.Singh,Gulzar Singh,S.S.Datta and I.M. Govil,Phys.Rev.C 40 (1989) 2400 .

10. Lifetime Measurement of Excited States in121,123 Te.K.C.Jain,Gulzar Singh ,S.S Datta, I.M.Govil and V.K.Mittal, Phys.Rev.C 41 (1990) 01282.

11. Structure of ^{75}Se GPS Sahota ,V.K.Mittal, S.D.Sharma, H.S.Sahota, K.C.Jain , K.P.Singh,Gulzar singh,and I.M.Govil,Phys.Rev.C 44 (1991) 987.

12. Angular momentum Induced Deformation ofCo 55 at 84 Mev Excitation, D.K.Agnihotri, A.Kumar, K.C.Jain, K.P.Singh. Gulzar Singh, I.M.Govil, D.Kabiraj, and D.K. Avasthi, Physics letter B 307 (1993) 283.

13. Systematics of Pre-equilibrium contributions in (n,p) reactions at 14 MeV Gulzar Singh, H.S.Hans, T.S.Cheema, K.P.Singh, D.C.Tayal, Jahan Singh, and Sudip Ghosh, Phys.Rev.C 49 (1994) 1066-1078.

14. Dynamical Effects in the decay of a Compound nucleus, I.M. Govil,,R. Singh, A.Kumar, Ajay Kumar, Gulzar Singh, S.K.Kataria and S,K,Datta, Phys.Rev.C 62 (2000) 064606.

15. Search for Entrance channel Effects in the heavy ion induced fusion reactions to the compound system ^{79}Rh, J.Kaur, I.M.Govil, Gulzar Singh,A.Kumar, Ajay Kumar, B.R.Behera, S.K.datta, Phys.Rev.C 66 (2002) 034601.

16. Search for entrance Channel Effects in the heavy ion induced fusion reactions via netron evaporation, Ajay Kumar, A.Kumar, G.Singh, B.K.Yogi, Rakesh Kumar S.K.Datta, M.B. Chatterjee and I.M. Govil,Phys.Rev.C 68 (2003) 034603.

17. Deformation Studies at high Spins in Gamma-soft ^{179}Re nucleu, S.K.Chamoli, P.Joshi, A.Kumar, G.Singh, R.P.Singh, S.Murlithar, R.K.Bhowmik, L.Chatturvedi,Z.Naik,C.R.Prahraj,and,I.M.Govil,Phys.Rev.C 69,(2004)034310.

18. Dynamical Effects in the Heavy ion fusion reactions of the compound nucleus ^{80}Sr via charged particle evaporation, J.Kaur,A.Kumar,Ajay Kumar ,G.Singh, S. K.Datta and I.M. Govil,Phys.Rev.C 70 (2004) 017601.

19. Anomalous behaviour of the level Density parameter in neutron and charged particle evaporation, Ajay Kumar, A.kumar, G.Singh, S.K.Datta and I.M.Govil, Phys.Rev.70 (2004) 044607.

20. Entrance channel effects in Fission of ^{197}Tl, Hardev Singh,Ajay kumar,Bivash R.Behera,G.Singh,and I.M.Govil et al, Phys.Rev.,C 76, 0446109 (2007).

21. Pre-compound neutron evaporation inlow energy heavy ion fusion reactions, Ajay Kumar,Hardev Singh,Rajesh Kumar, G.Singh,I.M.G ovil et al., Nuclear Physics A, 798 (2008).

22. Role of nuclear dissipation and entrance channel mass asymmetry in Pre-scission neutron multiplicity enhancement in fusion-fission reactions, Hardev Singh, K.S.Golda,Santanu pal, Ranjeet, Rohit Sandal, Bivash R..Behera, Gulzar Singh et.al. Phys. Rev. C 78, 024609 (2008).

23. Measurement of Neutron Miltiplicity from Fission of ^{228}U and Nuclear Dissipation, Hardev Sungh, B.R.Behera, Gulzar Singh, I.M. Govil et.al. Phys.Rev. C.80,064625 (2009).

24. Theoretical interpretation of the systematics of effective single particle densites from (n,p) reactions at 14.8 MeV energy, H.S.Hans, Gulzar Singh, A.Kumar, K.P.Singh, B. R. Behera and Sudip Ghosh Phys. Rev. C 85,054614 (2012).

25. Investigation of majot and trace elements in some medicinal plants using PIXE Rajbir Kaur, Ashhok Kumar, Navneet Kaur, B.P. Mohanty, Mumtaz Oswal, K.P. Singh, B.R. Behera, Gulzar Singh, Richa Puri Shika Sharma, Sanjiv Kumar, Pritty Rao, S. Vikramkumar, IJPIXE vol.22 Nos. 1 & 2 (2012) 113-119.

26. Elemental analysis of gorund water using PIXE and PIGE techniques, Internationa journal of PIXE, Rajbir Kaur, Ashhok Kumar, B.P. Mohanty, Mumtaz Oswal, Navneet Kaur, K.P. Singh, B.R. Behera, Gulzar Singh, Sanjiv Kumar, Pritty Rao, S. Vikramkumar, IJPIXE vol.22 C-0308.

27. Polarisation measurements and high spin structure in 131Ba, Navneet Kaur, A. Kumar, G. Mukherjee, Amandeep Singh, Varinderjit Singh et al. AIP Conf. Proc. 1524, 109 (2013).

28. Effect of fissility in fission time scales for $^{16,18}O$ + $^{194,198}Pt$ systems, Rohit Sandal, B. R. Behera, V. Singh, A. Kumar, G. Singh, K. P. Singh, M. Kaur, K. S. Golda, A. Jhingan, P. Sugathan, M. B. Chatterjee, R. K. Bhowmik, S. Mandal, S. Kalkal, D. Siwal, S. Goyal, E. Prasad, K. Mahata, A. Saxena, and Santanu Pal, AIP Conf. Proc. 1524, 167 (2013).

29. Rohit Sadal, B.R. Behera, Varinderjit Singh, M. Kaur, A. Kumar, G. Singh, K.P. Singh, S. Kalkal, D. Siwal, S. Goyal, S. Mandal, E. Prasad, K. Mahata, A. Saxena, J. Sadhukhan and Santanu Pal, Phys. Rev. C 87, 014604 (2013).

30. Anomalous deviations from the statistical evaporation spectra for the decay of ^{73}Br and ^{77}Rb compound systems, Maninder Kaur, B.R. Behera, Varinderjit Singh, G. Singh, Rohit Sandal, A.Kumar, Gurpreet Singh, K.P.Singh, H.Singh, D. Siwal, Sunil Kalkal, N. Madhavan, S.Nath, A. Jhingan, J. Ghelot, K.S.Golda, P. Sugathan, Prasad. E, A.Babu, Phys.Rev. C 89, 034621 (2014).

31. High spin structure in $^{130,131}Ba$, Navneet Kaur, A. Kumar, G. Mukherjee, Amandeep Singh, S. Kumar, Rajbir Kaur, Varinderjit Singh, B. R. Behera, K. P. Singh, G. Singh, H. P. Sharma, Suresh Kumar, M. Kumar Raju, P. V. Madhusudhan Rao, S. Muralithar, R. P. Singh, Rakesh Kumar, N. Madhvan and R. K. Bhowmik, Eur. Phys. J. A (2014) 50: 5.

32. Effect of N/Z in pre-scission neutron multiplicity for $^{16,18}O$+$^{194,198}Pt$ systems

Rohit Sandall, B.R. Behera , Varinderjit Singh, Maninder Kaur, A. Kumar, G. Singh, K. P. Singh, P. Sugathan, A. Jhingan, K. S. Golda, M. B. Chatterjee, R. K. Bhowmik, Sunil Kalkal, D. Siwal, S. Goyel, S. Mandal, E. Prasad, J. Sadhukhan, K. Mahta, A. Saxena, Santanu Pal, EPJ Web of Conferences 66, 03006 (2014).

B. Papers accepted in International journals

Spin distribution as a probe to investigate the dynamical effects in fusion reactions. Maninder Kaur, B.R. Behera, Gulzar Singh, Varinderjit Singh, N. Madhavan, S. Muralithar, S. Nath , J. Gehlot, G. Mohanto, Ish Mukul, Davinder Siwal, Meenu Thakur, Kushal Kapoor, Priya Sharma, A. Jhingan, T. Varughese, Indu Bala, B.K. Nayak, A. Saxena and M. B. Chatterjee, (accepted in VI International Conference Fusion-14).

C. Papers communicated to International journals

1. Entrance Channel Effects in the decay of the compound nucleus Cu^{61}, J.Kaur, Ajay.Kumar,A. Kumar, G.Singh, S.K.Datta and I.M.Govil (communicated Phys.Rev.C)

2. Coulomb Excitation of Low –Lying Levels of ^{49}Ga, K.P.Singh,Mumtaz Oswal, B.R. Behera,Ashok Kumar, and Gulzar Singh , (Communicated to Acta Physica Polonica B).

D. Papers presented at national or international conferences

1. Elastic scattering of alpha particles ^{40}Ca from Eα=4.4 to 5.6 MeV. S. Saini, S. Kailash, M. Balakrishnan, A. Chatterjee, Gulzar Singh, S. K. Gupta and M.K. Mehta, Nuclear Phys. And Solid State Physics Symposium (1976)16.

2. Total (p,n) cross-sectio for ^{48}Ca(p,n) ^{48}Sc reaction, Gulzar Singh, S. Saini, M. Balakrishnan, A. Chatterjee, Gulzar Singh and M.K. Mehta, Nuclear Phys. And Solid State Physics Symposium (1976) 29.

3. Fluctuation analysis of ^{48}Ca(p,n) ^{48}Sc. Total excitation function from 1.9 to 5.1 MeV, Gulzar Singh, S. Kailash, A. Chatterjee, S. Saini, M.K. Mehta Nuclear Phys. And Solid State Physics Symposium (1977).

4. Beam quality of operational characteristics of Chandigarh Variable Energy Cyclotron, I.M. Govil, Gulzar Singh and H.S. Hans. Nuclear Phys. And Solid State Physics Symposium (1977).

5. Cross-resonance in the total, excitation function for ^{48}Ca(p,n) ^{48}Sc reaction, Gulzar Singh, S. Kailash and M.K. Mehta, Nuclear Phys. And Solid State Physics Symposium (1977).

6. Study of isobaric analogue resonance in ^{42}Ca through the ^{41}K (p,n) ^{41}Ca reaction, S. Saini, Gulzar Singh, A. Chatterjee, M.K. Mehta Nuclear Phys. And Solid State Physics Symposium (1978).

7. Study of the ^{41}K (p,n) ^{41}Ca reaction, S. Saini, Gulzar Singh, A. Chatterjee, M.K. Mehta International conference on low energy nuclear physics held at Berkley in August 1980.

8. Shell model interpretation of analogue resonsnces in ^{42}Ca, Singh, A. Chatterjee, M.K. Mehta Nuclear Phys. And Solid State Physics Symposium (1980).

9. Systematics of analogue resonances, Gulzar Singh, A. Chatterjee, M.K. Mehta, Nuclear Phys. And Solid State Physics Symposium (1980).

10. Microscopic nuclear optical model potential at low energies, S. Kailas, S.K. Gupta, M. K. Gupta and Gulzar Singh, Nuclear Phys. And Solid State Physics Symposium (1980).

11. Beam extraction studies of the Chandigarh Cyclotron, Gulzar Singh, S.R. Bahadur and H.S. Hans Nuclear Phys. And Solid State Physics Symposium (1981) 24B, 227.

12. He++ induces reactions at low energies, Gulzar Singh, T.S. Cheema and H.S. Hans Proceeding, regional meeting on Nuclear Physics and Chandigarh Variable Energy Cyclotron, April 1982, Panjab University, Chandigarh, India.

13. Structure effects from the 14 MeV (n,p) reaction, Gulzar Singh, T.S. Cheema, K.P. Singh, D.C. Tayal and H.S. Hans, International conference on Nuclear Physics, Florence (Italy), September 1983.

14. Coulomb excitation of ^{165}Ho with protons , K.P. Singh, D.C. Tayal, Gulzar Singh and H.S. Hans, International conference on Nuclear Physics, Florence (Italy), September 1983.

15. Proton induced coulomb excitation of ^{68}Ga, D.C. Tayal, K.P. Singh, V.K. Mittal, Gulzar Singh and H.S. Hans, International conference on Nuclear Physics, Florence (Italy), September 1983.

16. Electromagnetic transmission probabilities of ^{105}Pd levels by coulomb excitation with protons, D.C. Tayal, K.P. Singh, V.K. Mittal, Gulzar Singh and H.S. Hans, Nuclear Phys. And Solid State Physics Symposium (1983).

17. Nuclear structure Parameters from coulomb excitation with 2.5-4.5 MeV protons, K.P. Singh, D.C. Tayal, Gulzar Singh and H.S. Hans International symposium on Particle and Nuclear Physics, Sept. 2-7 (1985, p.367. Peking, China).

18. Pre- Equilibrium processes in alpha induced reactions, Gulzar Singh, K.P. Singh and H.S. Hans, UGC workshop on utilization of 15 UD Pelletron, May 15-17 (1987), Deptt. Of Physics, Sukhadla University, Udaipur.

19. Coulomb excitation studies in Antimony Isotopes, K.C. Jain, K.P. Singh, Gulzar Singh, S.S. Datta and I.M. Govil, Bulletin of American Physical Society, Bulletin Amer. Phys, Soc, 33 (1988) 1781.

20. Alpha Particle emission in fusion reaction $^{28}Si+^{27}Al$ at 140 MeV, D.K. Agnihotri, A. Kumar, A. Taygi, J. Kaur, K.P. Singh, Gulzar Singh, I. M. Govil, D. Kabiraj and D. K. Avasthi, DAE Symposium on Nuclear Physics 35B (1992) 170-171.

21. Entrance channel effects in the decay of the compound nucleus, R. Singh, A. Kumar, A. Taygi, J. Kaur, Gulzar Singh, S.K. Dutta, S. K. Katariaa and I.M. Govil DAE Symposium on Nuclear Physics 42B (1999) 124.

22. Search for entrance channel effects in heavy ion indeuce reactions through the compound system $^{80}Sr^{*}$ J. kaur, G. Singh, A. Kumar, A. Tayagi, B. R. Behera, S. K. Datta, I. M. Govil, Conference on Accelerated based research in basic and applied sciences Feb 25-27, 2001, Nuclear science centre, New Delhi.

23. Measurement of stopping power of some polymers for alpha particles of 5.48 MeV, Naina Bharadwaj, A. Tyagi, A. Kumar, G. Singh, I.M Govil, Raj Mittal, S.C. Gupta and V. K. Mittal, 7^{th} Symposium on Radiation Physics (March 26-27, 2001), Physics department, Punjabi University, Patiala.

24. Neutron radiation as a probe for reaction mechanism for heavy ion induce reaction, A. Taygi, J. Kaur, A. Kumar, G. Singh, B.R. Behera, S. K. Dutta and I. M. Govil 7^{th} Symposium on Radiation Physics (March 26-27, 2001), Physics department, Punjabi University, Patiala.

25. Search for entrance channel effects in fusion reactions via neutron evaporation, Ajay Kumar, J. Kaur, A. Kumar, G. Singh, Rakesh Kumar, S. K. Datta, M.B. Chatterjee and I.M. Govil, DAE Symposium on Nuclear Physics 44B (2001) 212.

26. Entrance channel effects in decay of nucleus $^{79}Rb^{*}$, J. Kaur, G. Singh, A. Kumar, A. Tyagi, B.R. Behera, S.K. Datta and I.M. Govil, DAE Symposium on Nuclear Physics 44B (2001) 214.

27. Neutron evaporation as probe of entrance channel effects in heavy on induce fusion, Ajay Kumar, A. Kumar, G. Singh, S.K. Datta, I.M. Govil, DAE Symposium on Nuclear Physics 45B (2002) 254.

28. Entrance channel effects in the decay of compound system ^{61}Cu, J. Kaur, I.M. Govil, G. Singh, A. Kumar, A. Tyagi, and S.K. Datta, DAE Symposium on Nuclear Physics 45B (2002) 190.

29. Neutron Evaporation as a probe for dynamical effects in heavy ion fusion reactions, Ajay Kumar, A. Kumar, G. Singh, Hardev Singh, K.S. Golda S.K. Datta, I.M. Govil, American Institute of Physics (AIP) conference proceedings 704, p.501(2003).

30. α-particle evaporation from compound nucleus ^{76}Kr, Ajay Kumar, A. Kumar, G. Singh, Hardev Singh, K.S. Golda S.K. Datta, I.M. Govil, DAE Symposium on Nuclear Physics 46B (2003) 294.

31. Entrance channel effects in decay of compouns nucleas, Ajay Kumar, A. Kumar, G. Singh, Hardev Singh, K.S. Golda S.K. Datta, I.M. Govil, 91 Indian Science Congress Chandigarh (2004). [awarded as best poster]

32. PIXE analysis with Chandigarh Cyclotron, I.M. Govil, N.K. Puri, P. Balouria, G. Singh, B.P. Mohanty, and M.L. Garg, International PIXE Conference at Slovenia, 2004.

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